

ethylene (ETFE) copolymers, tetrafluoroethylene-perfluoroalkoxy (PFA) copolymers, poly (vinyl fluoride) (PVF) and poly (vinylidene fluoride) (PVDF) is activated by radiation or chemical initiation in the presence of a monomer, such as styrene, which can be functionalised to contain an ion exchange group.

**IN THE CLAIMS:**

Please replace claims 3-15, 17 and 18 with the following amended claims.

- 1                   3.       (Amended) A substrate according to claim 1, wherein the  
2 mixed amorphous silica fibres comprise one or more chopped strand(s) of  
3 amorphous silica.
- 1                   4.       (Amended) A substrate according to claim 1, wherein the  
2 amorphous silica fibres comprise a mixture of both microfibres and chopped fibres  
3 in the range of from 95:5 % to 5:95 % by weight of the mixture respectively.
- 1                   5.       (Amended) A substrate according to claim 4, wherein the  
2 amorphous silica fibres comprise a mixture of both microfibres and chopped fibres  
3 in the range of from 70:30 % to 30:70 % by weight of the mixture respectively.
- 1                   6.       (Amended) A substrate according to claim 1, wherein the  
2 fibres have a diameter in the range of from 0.1µm to 50µm.
- 1                   7.       (Amended) A substrate according to claim 6, wherein the  
2 fibres have a diameter in the range of 0.4µm to 9µm.
- 1                   8.       (Amended) A substrate according to claim 1, wherein the  
2 binder comprises a solution or dispersion of ion-exchange polymeric materials,  
3 non-ion-conducting polymers, or inorganic materials or mixtures thereof.
- 1                   9.       (Amended) A substrate according to claim 1 for use in the  
2 preparation of a composite membrane.
- 1                   10.      (Amended) A composite membrane comprising a porous  
2 substrate of fibres and at least one ion-conducting polymer, characterised in that the

3 substrate comprises a porous matrix of mixed amorphous silica fibres bound with a  
4 binder.

1 11. (Amended) A composite membrane according to claim 10,  
2 which when dried then boiled in water undergoes less than or equal to about  $\pm 9\%$   
3 change in the area.

1 12. (Amended) A composite membrane according to claim 10,  
2 wherein the total thickness of the membrane is less than 200 $\mu\text{m}$ .

1 13. (Amended) A composite membrane according to claim 10 for  
2 use in a fuel cell.

1 14. (Amended) A process for the manufacture of a substrate,  
2 comprising the steps of

3 (a) dispersing mixed amorphous silica fibres in water to form a  
4 slurry;

5 (b) depositing the slurry onto a mesh bed to form a network;

6 (c) drying and compacting the fibre network; and

7 (d) applying, before or after step (c), a dispersion of binder.

1 15. (Amended) A process for the manufacture of a membrane,  
2 comprising the steps of

3 (i) forming a porous substrate according to claim 14; and  
4 thereafter,

5 (ii) impregnating the porous substrate with a polymeric material  
6 to produce a membrane.

1 17. (Amended) A membrane electrode assembly comprising a  
2 composite membrane according to claim 10.

1 18. (Amended) A fuel cell comprising a composite membrane  
2 according to claim 10.

Please add the following new claim:

- 1                   19.   (Newly Added) A process according to claim 15, wherein  
2   mixed amorphous silica fibres are randomly oriented in said porous substrate.

Respectfully submitted,



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Kathleen Libby

